

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A transistor comprising:
a first region of a first conductivity type;
a second region of a second conductivity type that lies over the first region;
a third region of the first conductivity type that contacts the second region,
the third region being spaced apart from the first region; and
a fourth region of the second conductivity type that contacts the third region,
the fourth region being spaced apart from the second region.
2. (Original) The transistor of claim 1 and further comprising:
a trench that extends from the top surface of fourth region through the fourth region, the third region, and partially into second region;
a layer of insulation material that contacts the trench; and
a conductive gate region that contacts the layer of insulation material and fills the trench.
3. (Original) The transistor of claim 2 wherein the conductive gate region is a region of doped polysilicon.
4. (Original) The transistor of claim 2 wherein the first, second, third, and fourth regions have a <110> crystallographic orientation.
5. (Original) The transistor of claim 2 and further comprising a plug that is formed through the first region to contact the second region.
6. (Original) The transistor of claim 5 wherein the plug is metallic.

7. (Original) The transistor of claim 5 and further comprising:
a layer of isolation material that contacts the top surface of the fourth region,
the layer of insulation material, and the conductive gate region;
a gate contact formed through the layer of isolation material to make an
electrical connection with the conductive gate region; and
a drain contact formed through the layer of isolation material to make an
electrical connection with the fourth region.

8. (Original) The transistor of claim 2 and further comprising an
insulating layer that contacts the first and second regions.

9. (Original) The transistor of claim 1 and further comprising:
a plurality of trenches that extend from the top surface of fourth region
through the fourth region, the third region, and partially into second region;
a plurality of insulation layers that contact the plurality of trenches such that
each trench has an insulation layer; and
a plurality of conductive gate regions that contact the plurality of insulation
layers and fill up the trenches.

10. (Original) The transistor of claim 9 wherein the plurality of
conductive gate regions are regions of doped polysilicon.

11. (Original) The transistor of claim 9 wherein the first, second, third,
and fourth regions have a <110> crystallographic orientation.

12. (Original) The transistor of claim 9 and further comprising a plug
that is formed through the first region to contact the second region.

13. (Original) The transistor of claim 10 wherein the plug is metallic.

14. (Original) The transistor of claim 10 and further comprising:

a layer of isolation material that contacts the top surface of the fourth region, the plurality of insulation layers, and the plurality of conductive gate regions;

a plurality of gate contacts formed through the layer of isolation material to make electrical connections with the conductive gate regions; and

a plurality of drain contacts formed through the layer of isolation material to make electrical connections with the fourth region.

15. (Currently Amended) The transistor of claim 8 9 and further comprising an insulating layer that contacts the first and second regions.

Claims 16-20 (Cancelled)

21. (New) A transistor comprising:

a first region of a first conductivity type;

a second region of a second conductivity type that lies over the first region;

a third region of the first conductivity type that contacts the second region;

a fourth region of the second conductivity type that contacts the third region;

a trench having a sidewall that extends from the top surface of the fourth region through the fourth region, the third region, and partially into the second region;

a layer of insulation material that contacts all of the sidewall of the trench; and

a conductive gate region that contacts the layer of insulation material and fills the trench.

22. (New) The transistor of claim 21 and further comprising an insulating layer that contacts the first and second regions.

23. (New) The transistor of claim 21 wherein the second and fourth regions include regions with substantially equal dopant concentrations.

24. (New) The transistor of claim 23 wherein the conductive gate region is a region of doped polysilicon.